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BOISE

IDAHO FEDERAL RECLAMATION PROJECT

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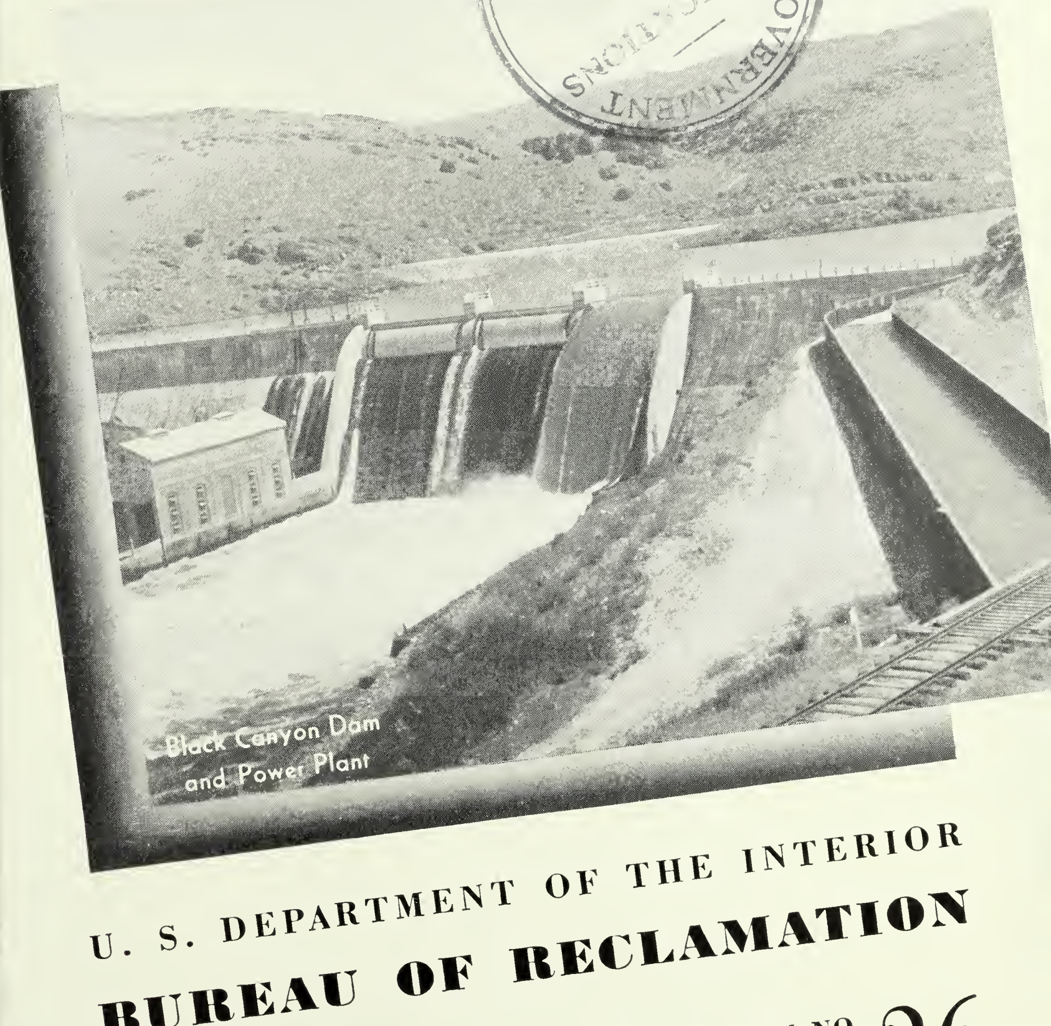

Black Canyon Dam and Power Plant

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

CONSERVATION BULLETIN NO. 26

State Capitol Building in Boise, Idaho

BOISE FEDERAL RECLAMATION PROJECT

UNITED STATES DEPARTMENT OF THE INTERIOR

HAROLD L. ICKES, *Secretary*

BUREAU OF RECLAMATION

JOHN C. PAGE, *Commissioner*

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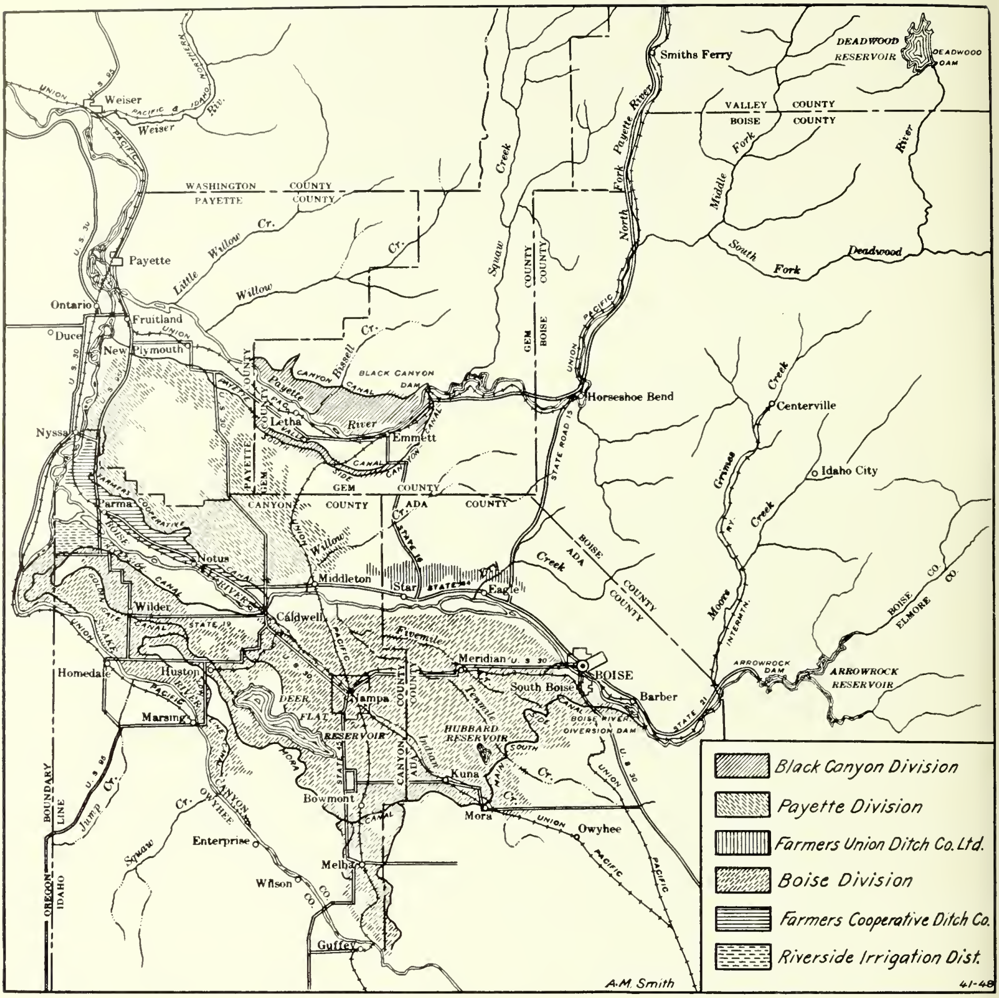
Map of Federal Reclamation projects . . Inside back cover

Map showing humid area and location of Federal Reclamation projects . . . . Back cover



▨	Black Canyon Division
▨	Payette Division
▥	Farmers Union Ditch Co. Ltd.
▨	Boise Division
▤	Farmers Cooperative Ditch Co.
▤	Riverside Irrigation Dist.

Boise Federal Reclamation project

BOISE

FEDERAL RECLAMATION PROJECT

Idaho

LOCATION OF PROJECT

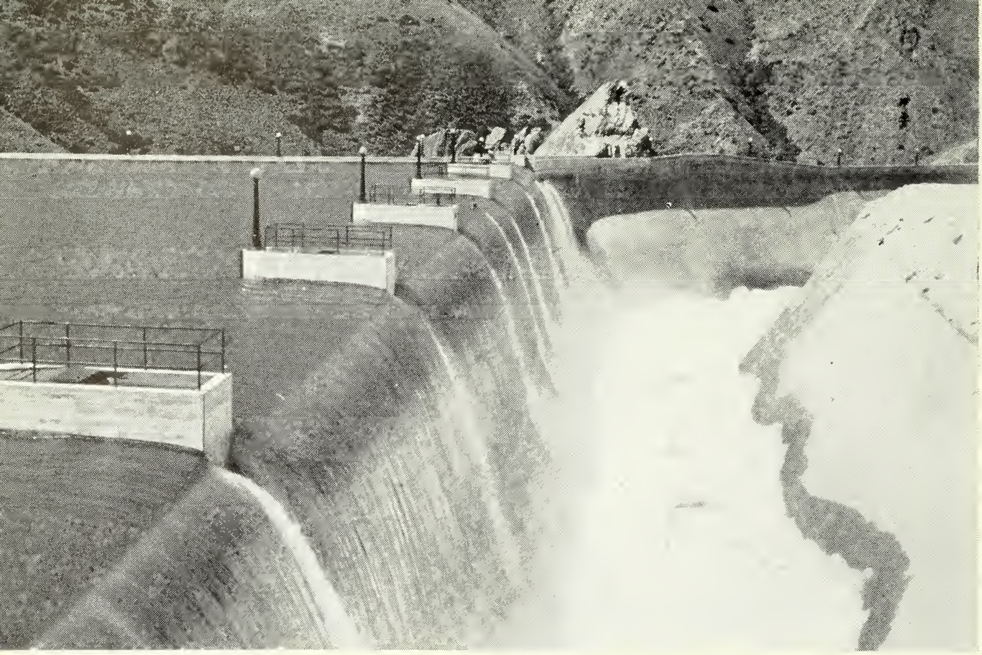
THE BOISE PROJECT is located in southwestern Idaho and eastern Oregon in the Boise, Payette, and Snake River Valleys. The irrigable lands are situated in Ada, Gem, Payette, and Canyon Counties, Idaho, with a small area in Malheur County, Oregon.

CLIMATIC CONDITIONS

THE ALTITUDE on the project ranges from 2,200 to 2,500 feet above sea level. The mean annual temperature is about 50° F., with an average annual range of —3° to 105° F. The usual growing season is between April 15 and October 15. The annual precipitation is about 10 inches. The region is well known for its healthful and pleasant climate and absence of severe storms.

HISTORICAL

THE FIRST RIGHT to divert water from the Boise River for irrigation purposes was granted in 1864, and the water was used to irrigate the town site of Boise and to supply Fort Boise. Agricultural activity in the Boise and Payette Valleys was started in the early eighties and settlers began filing on desert lands under private irrigation enterprises. Passage of the Reclamation Act in 1902 enabled landowners to organize and petition for Government development. Investigations were started in 1904 and by 1906 construction of the first features of the project in the Boise Valley was under way. The major part of the Arrowrock division was completed early in 1916 and the Notus division in 1921. The Payette division is now under construction.



Arrowrock spillway carrying 6,600 second-feet of water

WATER SUPPLY

THE WATER supply for the Arrowrock division is obtained from the natural flow of the Boise River and its tributaries, supplemented by storage provided in Arrowrock and Deer Flat Reservoirs. The Notus division is provided mainly from return flow of the Arrowrock division and partly from the Payette division and storage in Deer Flat Reservoir. Payette River water is used to supply the Payette division.

Arrowrock Dam, on the Boise River upstream about 15 miles airline east of the city of Boise, is a concrete, arch-gravity structure, 353 feet in height, and stores 286,500 acre-feet of water. Completed in 1915 to a height of 348 feet, it was for several years the highest dam in the world. It was recently raised 5 feet, and alterations were made to the spillway and repairs to the downstream face.

Deer Flat Reservoir, located near Nampa, offstream in an inland basin within the project area, is filled through the New York Canal during the nonirrigation season. Three earth-fill dams, 16, 40, and 70 feet high respectively, store 177,150 acre-feet of water.

Deadwood Dam on Deadwood River, a tributary of the Payette, is a concrete arch structure, 165 feet in height, storing 161,900 acre-feet, and was completed in 1930. This storage is utilized to provide a regulated flow for the power plant at Black Canyon. Deadwood Reservoir has sufficient capacity to provide a partial storage supply for irrigation of the Payette division. However, as water used for irrigation will not be available for generation of electricity, it will be necessary to provide additional storage for irrigation to avoid interference with the output of power needed for pumping. It is proposed to construct the Cascade Dam and reservoir of 700,000 acre-feet capacity on the North Fork of Payette River near the town of Cascade.

To supplement the water supply on the Arrowrock division and private irrigation developments in the Boise Valley, the Anderson Ranch Dam and reservoir of 500,000 acre-feet capacity is under construction on the South Fork of the Boise River near the village of Pine.

IRRIGATION WORKS

WATER is diverted for the Arrowrock division from the Boise River at the Boise River Diversion Dam about 7 miles southeast of the city of Boise, and is carried to the project through the New York Canal, which has a capacity of 2,800 second-feet. The diversion dam is of the rubble concrete weir type with an ogee overflow spillway of 40,000 second-feet capacity, and is 68 feet in height. Arrowrock Dam and Boise River Diversion Dam and power plant are reserved works and are operated by the United States. Deer Flat Reservoir and the canal system for the Arrowrock division are operated by the Boise Project Board of Control,

Arrowrock Dam and Reservoir

representing several irrigation districts on the project. Water users also operate the canals of the Notus division.

The Black Canyon Main Canal, of the Payette division, with an initial capacity of 1,090 second-feet, begins at the Black Canyon Dam and extends along the south edge of the Payette Valley for 27 miles, then connects with a distribution system of branch canals and laterals, serving en route the south side lands of the Emmett Irrigation District.

Black Canyon Diversion Dam, a concrete gravity structure with an ogee overflow section 183 feet in height, was completed in 1924. Its original purpose was to divert water to 22,000 acres in the Emmett Irrigation District near the town of Emmett, Idaho, and to develop power for pumping and later to serve also as a diversion dam for the Payette division lands. The Payette division is operated by the United States.

ANDERSON RANCH DAM

ANDERSON RANCH DAM, now under construction 25 miles southeast of Boise on the South Fork of the Boise River, will be another superlative achievement of the Bureau of Reclamation. The structure will reach an ultimate height 444 feet above the lowest point in the cut-off trench and will be the highest earth-fill dam and the fifth highest of any type in the world.

It will be approximately 2,900 feet, more than half a mile, thick at the base and about 1,350 feet long at the crest. Nearly 10,000,000 cubic yards of

Black Canyon Dam. Water spilling

Anderson Ranch dam site

clay, sand, and gravel will be moistened, rolled, and compacted in the embankment.

Anderson Ranch, like other large dams built and under construction by the Bureau, will be multipurpose. It will control floods, generate power, and provide a storage water supply for irrigation.

The power plant, which will contain two main generating units of 15,000 kilowatts each and station or "house" service generating equipment, will be located at the downstream toe of the dam on the left bank of the river. The powerhouse will be of reinforced concrete.

The reservoir will have a capacity of 500,000 acre-feet, or about 163,500 million gallons, and will be 324 feet deep at the dam.

The dam and power plant should be in operation late in 1945 or early in 1946.

POWER DEVELOPMENT

A THREE-UNIT power plant of 1,875 kilovolt-ampere capacity at the Boise River Diversion Dam was completed in 1908. At Black Canyon Dam a two-unit power plant of 10,000 kilovolt-ampere capacity was com-

Right: Arrowrock Dam spillway in operation

Below: Series of lateral drops through a Boise orchard

pleted in 1926, and a pumping plant of 300 second-feet capacity with two direct-connected pumping units, completed in 1924. The pumping plant supplies water to the Emmett District's North Side Canal. The summer power generated is used mainly for pumping irrigation water on the Owyhee project and the winter power is furnished to the Minidoka project through an exchange with the Idaho Power Co.

IRRIGABLE LANDS

THE ENTIRE PROJECT, including older privately developed districts in the Boise Valley which receive only a supplemental supply from the Boise storage system, and the Payette division now under construction, comprises an area of approximately 400,000 acres. The project developed by the Bureau of Reclamation is divided into four divisions. The Arrowrock division, extending westerly nearly 50 miles from just above Boise and between the Boise and Snake Rivers, has an irrigable area of 168,755 acres. Boise, Nampa, and Caldwell are the principal cities. The Notus division lies just north of the Boise River between Caldwell and Notus and has an irrigable area of 6,894 acres. The town of Notus is located in the Notus division. The Payette division lies between the Boise and Payette Rivers, east of the Snake River and adjoining the Notus division and the old lands of the Boise and Payette Valleys. The entire area totals approximately 52,000 acres. About 27,000 acres are reached by gravity and the balance by pumping, with a maximum lift of 90 feet. Part of the power for pumping will be supplied by the Black Canyon plant.

There are no towns on the Payette division, but adjacent towns include Caldwell, Notus, Parma, Emmett, New Plymouth, and Fruitland, Idaho, and Nyssa, Oreg.

The proposed Hillcrest division, lying above the main canal south and east of Boise, has an area of approximately 14,000 acres. Its development is contingent upon a future supplemental water supply and construction of irrigation works.

A limited area of public land for homesteading, located in the Payette division has been subdivided, the farm units opened to settlement, and tentative awards of homesteads made. Some lands in private ownership are for sale and can be purchased from the owners. The price of unimproved land ranges from $5 to $25 per acre, and improved land from $75 to $150, depending upon location of the tract, its fertility, water rights, and state of development. Small tracts near project towns occupied as suburban home sites sell at rates of $250 to $500 per acre.

To prevent land speculation and arrive at proper values, all the lands in the Payette division have been appraised on the basis of marketable prices without reference to any enhancement resulting from the construction of the irrigation works. These appraisals vary from $5 to $15

First irrigation on a Boise project farm

Orchards irrigated from Black Canyon Canal

per acre, contingent upon the character and depth of the soil and its topography. Nonirrigable land is appraised at $1 to $2 per acre. The contract with the Black Canyon Irrigation District provides that no part of the water supply shall be delivered to any district lands except those whose owners have executed individual recordable contracts agreeing to dispose of their lands, in the event of sale or transfer thereof, at fair prices. If any of the lands covered by such agreements, in tracts of 160 acres or less, are disposed of at prices in excess of appraisals, the seller is required to pay to the district, or the purchaser shall pay to the district out of the money which otherwise would have been payable to the seller, an amount in cash equal to 50 percent of such excess. These installments are credited upon the construction and operation and maintenance charges against the lands involved.

SOILS

THE SOILS of the project vary as to composition. The eastern portion of the project in the vicinity of Boise, Meridian, and Kuna is generally clayey loam, underlain with volcanic rock or gravel. In the section around Deer Flat Reservoir and the town of Wilder, clayey and sandy loam are underlain at great depth with gravel. The lands of the Snake River slope usually have a sandy loam. The soil in general over the entire project is deep and fertile and does not contain alkali in quantities injurious to plant growth.

CROPS

THE SOIL and climate are favorable for the growth of practically all temperate-zone crops. Grains, grasses, fruits, and vegetables yield well in this locality. Alfalfa and clover for both hay and seed are profitable crops. Corn for grain or silage gives good returns. Irrigated pastures have a large carrying capacity. Sugar beets are becoming an important crop. Potatoes, onions, apples, and prunes all produce heavily. Head lettuce has been grown on an extensive scale during the past few years. New lands of the Payette division are particularly adapted to the production of various seed crops.

LIVESTOCK

MUCH OF THE SOIL in the upper portions of the project is heavy, clayey loam naturally adapted to pasture and highly productive of forage crops. Large numbers of sheep and cattle are grazed on open ranges

Growing mustard under irrigation

Harvesting onions

A celery field near Nampa

surrounding the project during the spring and summer, and winter on the project, creating a local demand for these forage crops. Dairying is a large, dependable, and well-organized industry. Poultry raising also rates as an important industry.

MARKETS

LUMBER AND MINING industries in the surrounding territory purchase forage, fruits, meats, and vegetables in large quantities. Most of the alfalfa and corn is fed to dairy cows, range sheep, and cattle, and to animals being prepared for market. The greater part of the apples, prunes, potatoes, lettuce, and clover seed is shipped to Missouri River points and eastern markets. Dairy products, eggs, and poultry are marketed in nearby towns or on the Pacific coast, particularly California, which is a rapidly expanding market. Canneries at Wilder and Payette pack corn, peas, and other vegetables and fruits. A $2,000,000 beet sugar factory has been constructed at Nyssa, on the edge of the project. Large cooperative creameries at Meridian, Caldwell, and Payette and a Carnation milk factory at Nampa handle most of the dairy products. Cooperative associations and numerous produce houses provide facilities for distributing and marketing farm products.

TRANSPORTATION

THE MAIN LINE of the Union Pacific Railway extends through the project from east to west, with four branch lines connecting all of the project towns. Motor bus and freight lines have been extended from the principal towns to cover all parts of the valley. The transcontinental highway, U. S. No. 30, passes through the project. The Yellowstone

Cutoff and U. S. Highway No. 95 connect the project with coast cities to the west and southwest. Highways and market roads, with gravel and hard surface, have been constructed over the entire project. These make the towns, as well as railway sidings, easily accessible from the farm lands, and good roads through the mountainous region make it possible to reach recreational areas in a few hours travel by automobile. The project is on a transcontinental airline, and the large modern Boise airport accommodates six Mainliners daily as well as much private flying activity. Several other project towns have airport facilities.

INDUSTRIES AND UTILITIES

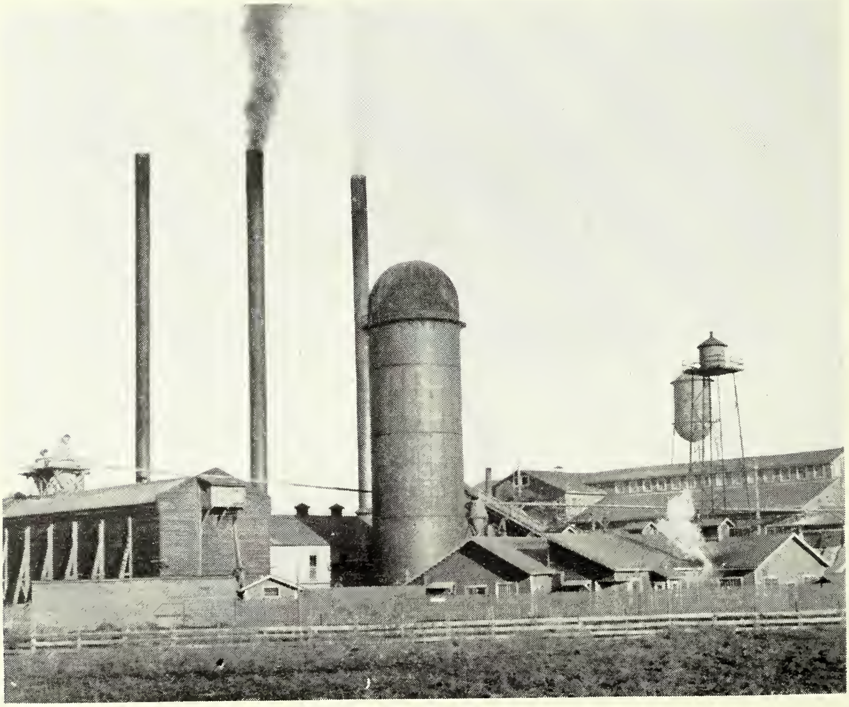
IN ADDITION to several lumber mills, a fruit and vegetable cannery, and a beet sugar factory, there are fruit evaporating plants, creameries, meat-packing plants, bakeries, candy plants, sash and box factories, foundries, machine works, bottling works, and plants manufacturing brick and concrete products in or adjacent to the project. The Pacific Fruit Express Co. shops are also located on the project at Nampa. Power and transmission lines and telephone and telegraph facilities serve the entire project. Several daily newspapers are published in the larger project towns and weekly papers in the smaller towns.

TOWNS

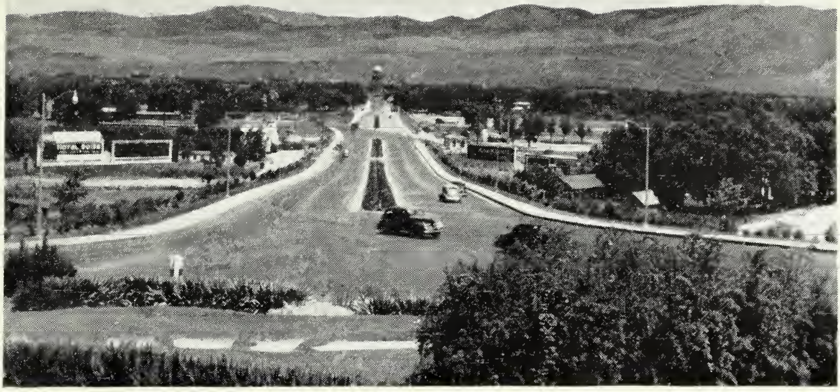
BOISE, the State capital and Ada County seat, with a population of nearly 27,000, is at the northeast corner of the project. Nampa, near the center of the project, has a population of more than 12,000. Caldwell, Canyon County seat, with a population of about 7,200 is only 9 miles to the west. Parma, Meridian, Kuna, Melba, Notus, Wilder, Nyssa, Ontario, Fruitland, New Plymouth, and Emmett are all thriving towns in or adjacent to the project.

Sorting and packing peaches

A Jersey herd



Upper: A public road along Black Canyon Canal
Lower: Boise-Payette Lumber Co. sawmill



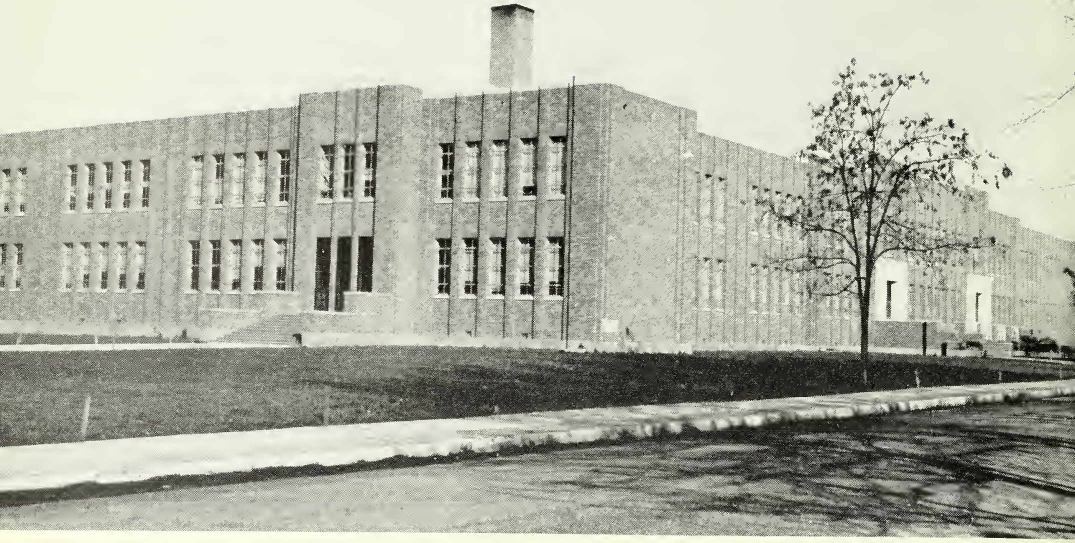
Upper: Capitol Boulevard, Boise
Lower: Caldwell Business District

SCHOOLS

THE SCHOOL facilities of the Boise project are excellent. All the towns have high schools and, in addition, there are several rural high schools conveniently located. Grammar schools of 2 to 10 rooms are so located that they are easily accessible from each farm. All the school buildings are modern and well constructed. In Boise there are the Boise Junior College, St. Teresa's Academy, and two well-equipped business colleges. The College of Idaho is located at Caldwell and the Nazarene College at Nampa. All the principal religious denominations are represented in the towns.

FARMERS' ORGANIZATIONS

COMMUNITY ORGANIZATIONS on the project include granges, women's clubs, and producing and marketing groups cooperatively



Boise Junior High School

Dairyman's Cooperative Creamery at Caldwell

owned and operated. Project water users owning land within the project are organized into irrigation districts under State laws.

OPERATING CONDITIONS—COSTS

LAND OWNERS are required to return the construction cost of the project irrigation works, without interest over a period of years, in addition to costs of operation and maintenance. The cost of the power system is repayable from power revenues. The irrigation works of the Arrowrock and Notus divisions have cost to date about $70 per acre, to which will be added a share of the cost of supplemental storage when it is provided. The construction cost of the Payette division is estimated at about $135.

On the Arrowrock and Notus divisions, repayment of the construction cost is made in annual installments based on 5 percent of the average

Headworks of Black Canyon Canal

Lower Deer Flat Canal

gross acre income for the preceding 10 calendar years. On the Payette division the repayment period is fixed at 40 years.

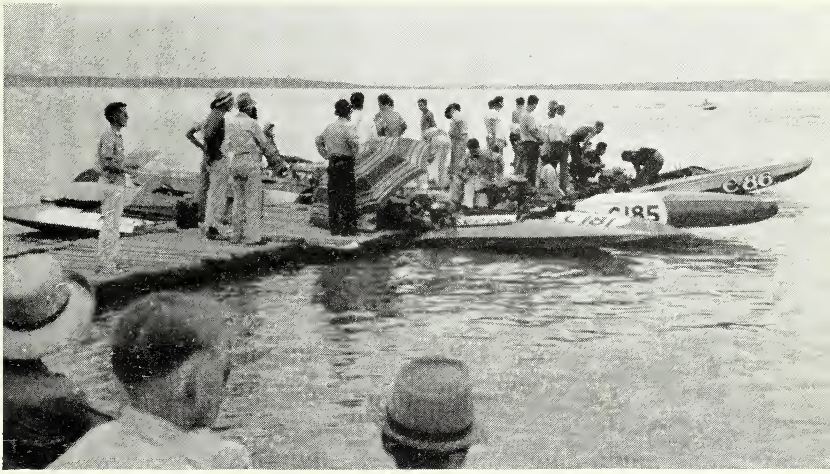
The operation and maintenance of the Arrowrock division canals and the Deer Flat Reservoir have been turned over to the water users and are carried on by a Board of Control with headquarters at Boise, Idaho, representing the five irrigation districts included in the division. A toll charge is made of $1 to $1.20 per acre, which entitles the water users to 3 acre-feet of water per acre, and an additional charge is made for water used in excess of that amount.

The canals of the Notus division, the first unit of the Black Canyon Irrigation District, are also being operated by the water users of that district and assessments are made to meet the actual cost of the work.

Water is being delivered to the gravity lands of the Payette division on a rental basis. The development of the pumping unit of the Payette division is being deferred until additional storage is made available.

RECREATION

FULL RECREATIONAL facilities are available throughout the entire project. In the towns are numerous parks, playgrounds, and swimming pools. Project reservoirs and nearby lakes attract many boating and swimming enthusiasts. Much interest is taken in softball and basketball leagues. Excellent hunting and fishing can be had within easy driving distance from any point on the project. Game birds include pheasants, partridges, quail, grouse, ducks, and geese. Big game, which is


Boat dock, Water Sports Association regatta, Deer Flat Reservoir

Children playing in a Boise park

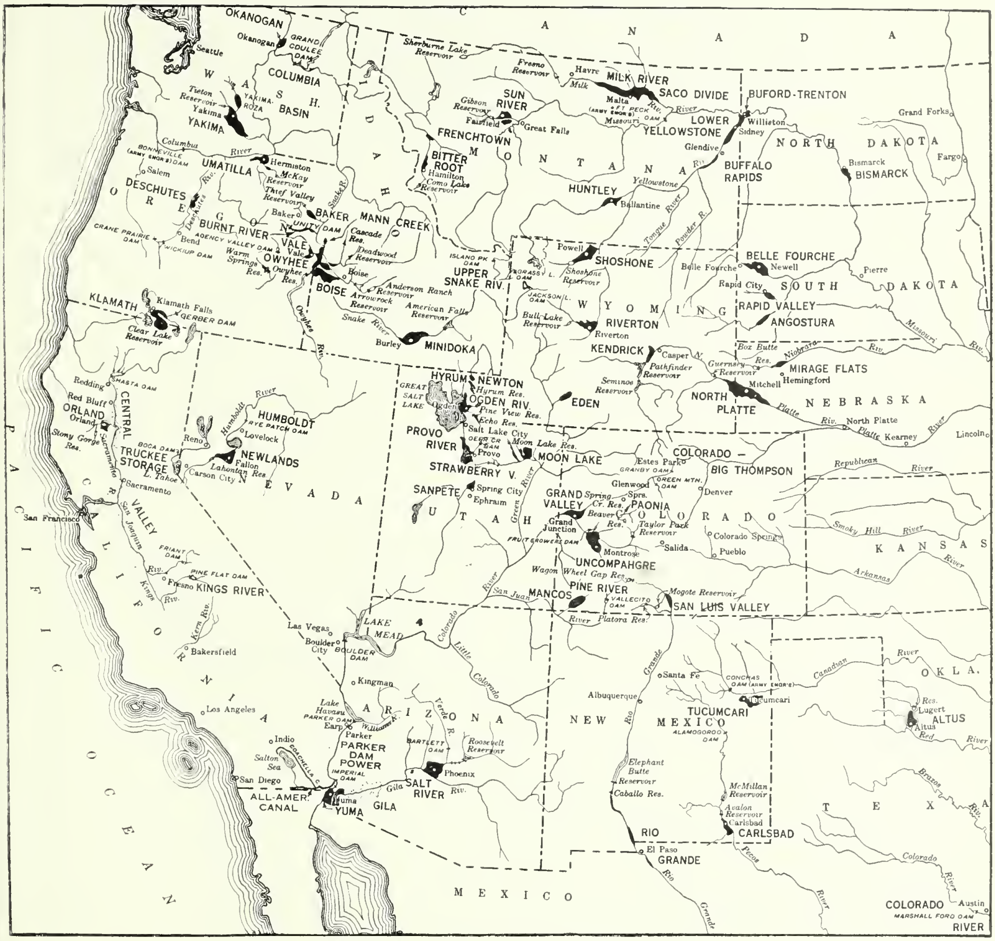
Wild geese

Herd of deer near Boise

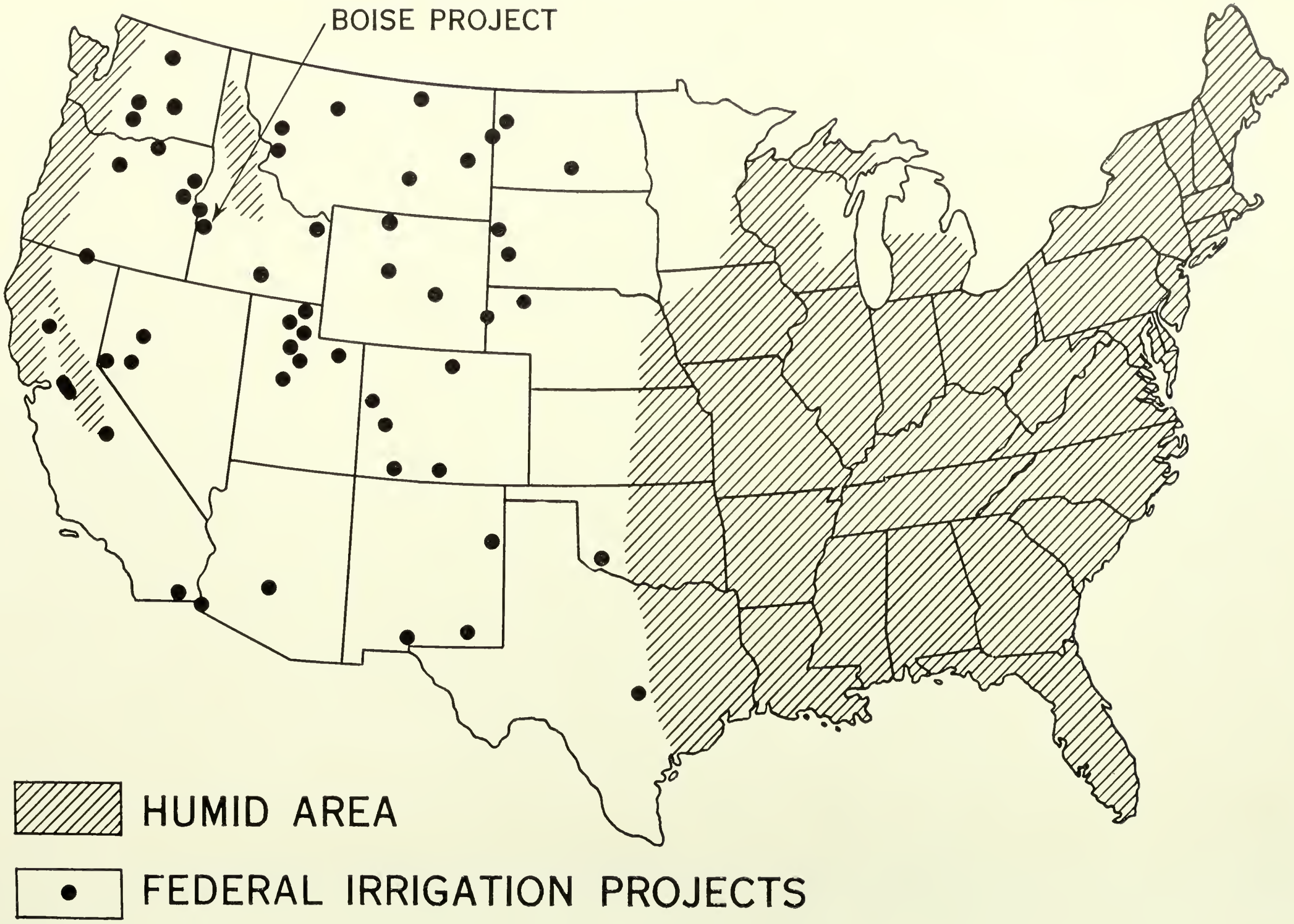
In season quality fish abound in Boise project reservoirs

Scene in Howard Platt Public Gardens adjacent to Union Pacific Station, Boise, Idaho

hunted in the nearby mountains and primitive areas, includes deer, antelope, bear, elk, mountain sheep, and goats. Large catches of trout, bass, crappies, and other fish are made in the streams, lakes, and reservoirs. Well-maintained roads give easy access to famous ski courses at Sun Valley, Payette Lakes, and Bogus Basin.



Federal Reclamation projects


BOISE PROJECT
▨ HUMID AREA
● FEDERAL IRRIGATION PROJECTS